



QUANTITATIVE





EDITION - DEC 2019

Copyright @ 2019 by SIERRA INNOVATIONS PVT. LTD.

All rights reserved. No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods, without the prior written permission of the publisher. Breach of this condition is liable for legal action.

The moral right of the editor has been asserted.

Printed by SIERRA INNOVATIONS PVT. LTD. In India

For any complains, suggestions or feedback feel free to contact us on hello@toppersnotes.com

Head office -Toppersnotes SIERRA INNOVATIONS PVT. LTD. 52, Radha Mukut Vihar, Golyawas, New Sanganer Road, Mansarovar, Jaipur, Rajasthan-302020

MRP - 799/-

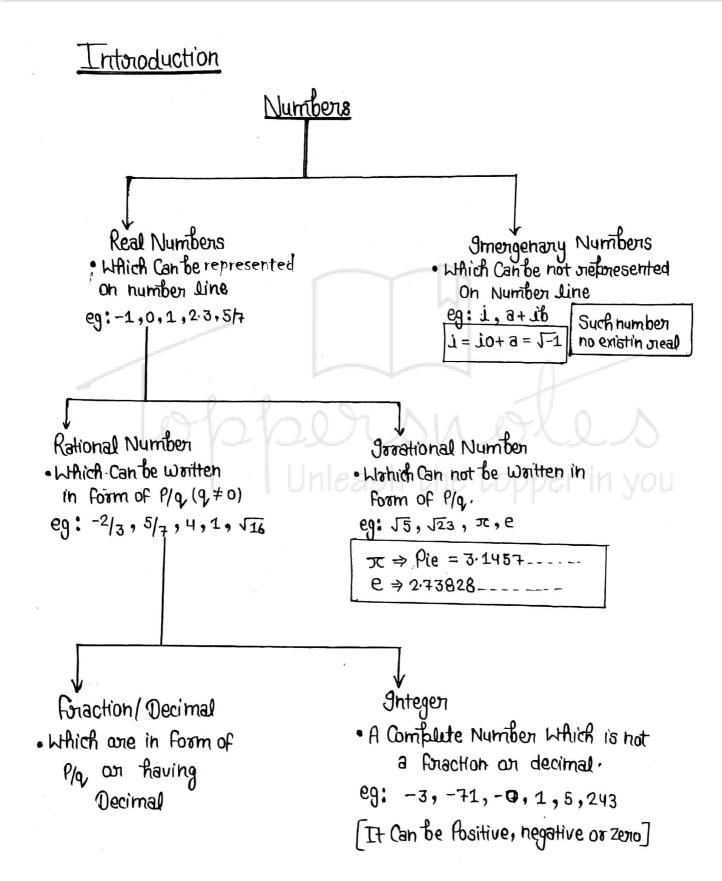
Website- <u>www.toppersnotes.com</u> Email :- hello@toppersnotes.com

Contents

1.Number System	01
2.HCF & LCM	20
3.Fraction & Decimal	37
4.Surds & Indices	50
5.Algebra	71
6.Trigonometry	109
7.Geometry	137
8. Mensuration	169
9.Height & Distance	181
10. Statics	190



NUMBER SYSTEM



- Whole Numbers: Integers Starting From O.
- Natural Numbers: Integens Stanting From 1.
- <u>Porime Numbers</u>: The number Which is divisible by 1 & no. itself is Called a Porime number.

Unleash the topper in v

eg: 2, 3, 5, 7, 11, 13 etc

1 is not a Porime humber

There are 25 Porime number b/w 1 to 100

• <u>Composite Number</u>: The number which have more than two factors are called composite numbers.

eg; 4,6, 12, 21, 28 etc.

The numbers which are not prime are Composite Number <u>Co-Ponime Number</u>: Numbers having their HCF is 1 are termed as Co-prime Numbers. eg: 14 & 15.

Even Number: Rational number Which are the multiple of 2 is Called as even numbers.

eg: 2,4,6,48,92 ____etc.

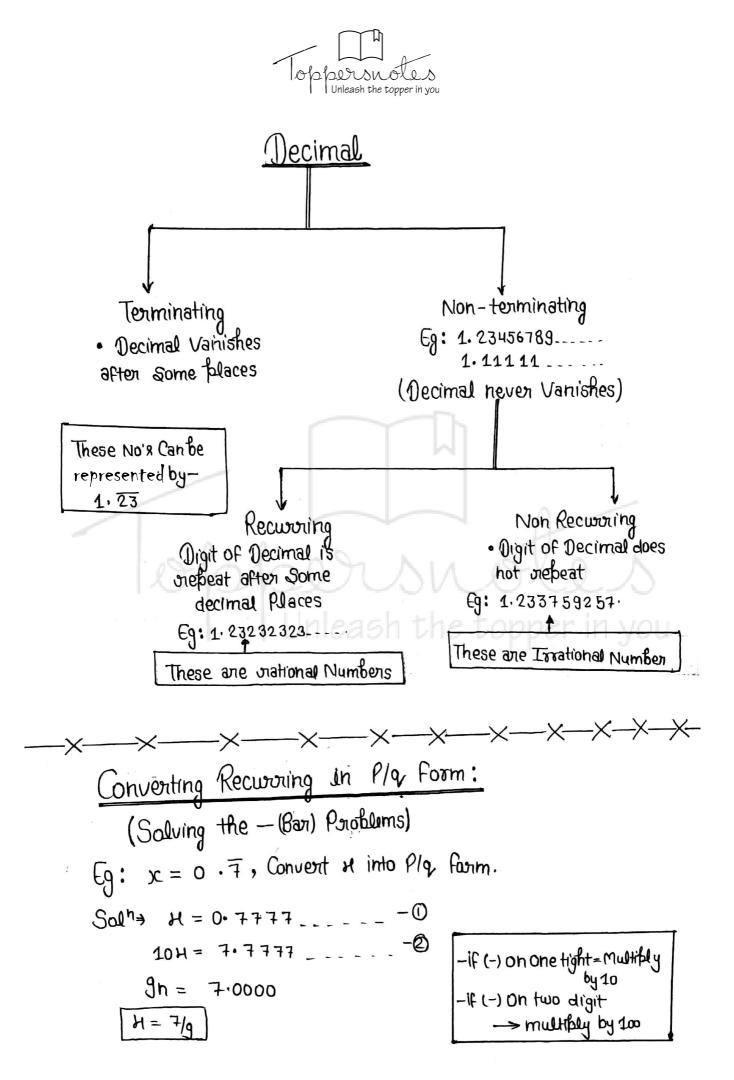
Odd Number: Rational Numbers Which are not multiple of 2 are Odd. Number.

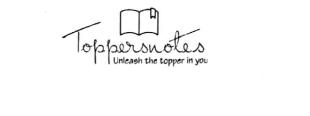
eg: 1, 3, 5, 91, 103, 249						
leven	Numbers	ending digit is 2,4,6,8,0 &				
Odd	Nymbers	ending digit is 1,3,5,7,9				

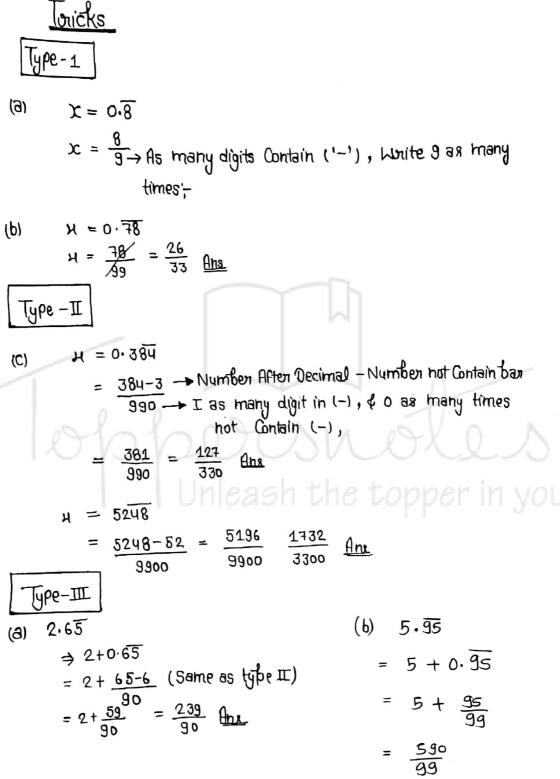
Unleash the topper in you

Properties of Odd and even Numbers:

- even + even = Even
- ODD + ODD = Even
- Even + ODD = ODD
- Even + Even _ - - + n times = Even (always)
- Odd + Odd _____ Odd numbers of times = ODD
- ODD + ODD ----- even number of times = Even
- Even x Even = Even
- Eved x odd = Even
- Odd x odd = Odd
- Even x (Even / Odd) = Even









Divisibility Rules =

Number	Rule	EXAMPLE	
2	Last digit is divisible by 2, or last digit is 0,2 4,6,8.	Eg:2348 1948	
3	Sum of digit is divisible by 3.	Eg: 1071 1+0+7+1=9	
ц	Jast two digit of number is divisible by 4	14 <u>32</u> 92 <u>84</u>	
5	Last digit is 5 or 0	2335, 1990	
6	Number is divisible by 2 and 3 each	132→divisible by2 1+3+2→divisible 3	
707	•Multiply last digit by 5 • Add the above number • IF Jemaing digits divisible 7, then number is divided by 7	Eg: 343 (i) $3 \times 5 = 15$ 34-15 = 49 divisible by 7.	
8	Last 3 digit ane divisi- bu by 8	8032→32 Divisible by 8	
9,	Sum of digits is divis- ible by g	$1071 \rightarrow 1+0+7+1=9$ $d_{1}v_{1}s_{1}b_{1}g_{1}g_{1}$	
11.	• Definence of Sum of digit at odd Places & Sum of digit at Sven Tplacex.	• 1331 (3+1) - (3+1) = 0 • 11718520 (1+7+8+2) - (1+1+5+0)=11	

6

(2) IF 3H2680, is divisible by 11, then the Value of H is:

Unleash the topper in you

Solh: (Sum of Odd Rlace digit) - (Sum of Even Rlace digit) = (3+2+8) - (++6+0)= 13-6-4= 7-4 (Eithen 0 or divisible by 11) = 7+4=0 H=7 Ang. Unleash the topper in you

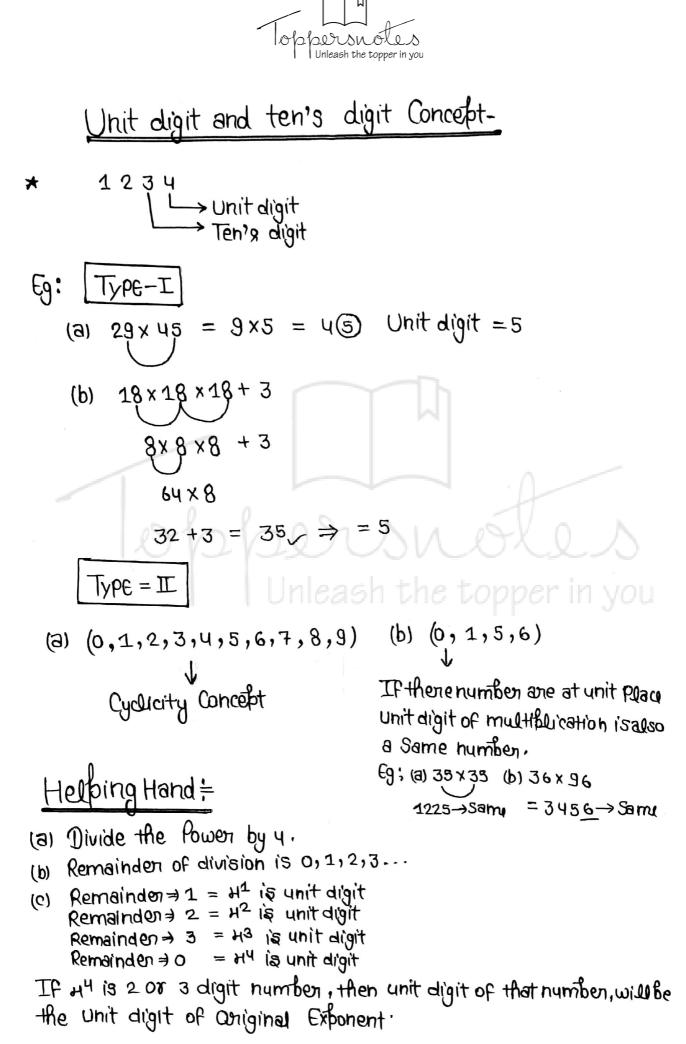


<u>Cyclicity:</u>

Unit digit is subjected after some time of an enforment.

$2^{1} = 2$ $2^{2} = 4$ $2^{3} = 8$ $2^{4} = 16$ $2^{5} = 32$ $2^{6} = 64$	$3^3 = 27$ $3^4 = 81$ $3^5 = 243$ $3^6 = 729$	$y^{1} = y$ $y^{2} = 16$ $y^{3} = 64$ $y^{4} = 216$ Cyclicity=2	$7^{1} = 7$ $7^{2} = 49$ $7^{3} = 343$ $7^{4} = 2401$ $7^{5} = 16807$ Cyclicity =4
Cyclicity =4	Cyclicity = 4		0
$8^{1} = 8$ $8^{2} = 64$ $8^{3} = 512$ $8^{4} = 4096$ $8^{5} = 32768$	$9^{1} = 9$ $9^{2} = 81$ $9^{3} = 729$ $9^{4} = 6561$ Cyclicity=2		per in you
Cyclicity = 4			

Eq. (2)⁴²³, Find the digit at units Place Soln (a) divide the power by 4 In Examsdivide in 4)<u>423</u> (105 Remainder = 3 drind, not in Pen-Paper, $\frac{4}{23}$ $2^3 = 8$ Anz 2^3



_

(4) Which one of the fallowing no. is divisible by 11? (c) 315624 (d) 415624 (b) 245642 (a) 235641 Saln=> (a) 235641 (2+5+4) - (3+6+1) = 1 (not divisible by 11) (b) 245642 (2+5+4) - (4+6+2) = 1 (not divisible by 11) (C) 315624 (3+5+2) - (1+6+4) = -1 (not divisible by 11) (4+5+2) - (1+6+4) = 0 (divisible by 11) (d) 415624 IF a number is divisible by 11, the Difference of Sum of digit at odd places & sum of digit at even places is either O On divisible by 11. Which on the fallowing number is divisible by 24 -(5) (b) 63810 Saln → (a) (C) 63810 35718 (C) 537804 (d) 3125736 (3) (8)35718 3+5+7+1+8 718 x = 2y 🗸 63810 6+3+8+1+0 810 X = 18 🗸 537804 5+3+7+8+0+4 804 X = 27 🗸 736~ 3+1+2+5+7+3+6 3125736 = 27 ~ If a hovis divisible by another number then it must be divisible by it's prime factors.

Unit digit Concept: The digit at unit's place of the Product -6 81 x 82 x 83 ----- × 89 JS (b) 2 (c) 6 (d) 8(a) OSaln→ 81×82×83×84×85....×89 1x2 x 3 x 20 --- X6 x7 x8 x9 =0IF we multiply a number by 0, the nesult at unit place is always zero. (1) The digit in unit's Place of the Product (2153) 167 is: (a) 1 (b) 3 (c) 7 (d) 9 Soln = 215 $3 \rightarrow$ Let base is 3h the topper in you **b** $\frac{167}{4} \Rightarrow$ Remainder is 3 $\bigcirc 3^3 = 27 \rightarrow \text{unit digit is } 7$ Ohit digit in (264) ¹⁰² + (264)¹⁰³ is -(C) 6 (d)(b) 4 (a) 0 Saln \Rightarrow (264) $\frac{102}{102}$ + (264) $\frac{103}{103}$ IF Base is 4, then (a) = Unit digit of even power is always 6 (b) = Unit digit of odd Power is always 4. = 6 + 4= 10 Unit digit = 0 because Cyclicity is 2

Unleash the topper in you (9) Unit digit of (169)⁵³⁷ + (94)³⁹⁴ is. (d) (b)(C)(8) Saln⇒ (169)⁵³⁷+ (94)³⁹⁴ IF the Base is 9 (a) Unit digit of ODD Power is always g. 6 9 + (b) unit digit of even Power is always 1. = 15 because Cyclicity is 2. = unit digit is 5 Ane (10) The dugit in the unit blace of $(251)^{98} + (21)^{29} - (106)^{100} + (105)^{35} - (16)^{4} + 259 + (73)$ is -(c) 5 (d) 6 (b) 4 (a) 1 Soln= $(251)^{98} + (21)^{29} - (106)^{100} + (705)^{35} - (16)^{4} + 259 + (73)^{51}$ 1 + 1 - 6 + 5 - 6 + 9 + 7Unit digit of base 1, 5, 6, is always Same 51 =Remainder 3 3 == 23-12 = 11 Ang each the top $3^3 = 27$ (1) Unit digital in expression of (2137)⁷⁵⁴ is -(a) 1 (b) 3 (C)7 (d) 9 Saln = (2137)⁷⁵⁴ → Base in 7 $\frac{754}{4}$ Remainder = 2 $7^2 = 49 \rightarrow \text{unit digit is } 9 \checkmark$ Find the unit's digit of (358) 64 ~ (253) 36-(12) (C)7 (b)Y (d) 9 (2) 5 Saln= (358)64~ (253)36 $\begin{array}{ccc}
\underline{64}^{} & \underline{36} \\
\underline{8} \\
0 & \longrightarrow & \text{Remainden} \leftarrow \underline{8} \\
\end{array} \xrightarrow{34} \xrightarrow{34} \xrightarrow{3} & \underline{34} \\
\end{array}$ $8^{4} = 64 \times 64 = 16 - 1 = 5 Anx$



solved examples

1- what Least Number must be added to 1056, so that sum is completely divisible by 237 $(\alpha)_2$ (b) 2 (d) 21 (c) 18 sol. 23 1056 (45 92 136 115 21 then number added is = 23-21 = 2. 2- The largest 4 digit number Exactly divisible by 88 is-(a) 9944 (b) 9768 (c) 9988 (d) 8888 sal. Langest y digit Number = 9999 88) 9999 (113 319 264 55 -> Sub tract from the 4 digit largest humber = 9999 - 55 = 9944. 3-4 the number 517x324 is completely divisible by 3, them the smallest whole no. in place of x will be-(a) 0 (6) 1 (c) 2 (d) None sol. If number indivisble by 3 5+1+7+ ++3+2+4 them sum of digit is also = 22 + H divisible by 3.

IF 2 is used in place of H, then number is divisible by 3 (i-e-24)

4-which one of the following no. is divisible by 11? (a) 235641 (b) 245642 (c) 315624 (d) 415624 sal. (a) 235641 (2+5+4)-(3+6+1) = 1 (not divisible by 11) (b) 24G642 (2+5+4)-(4+6+2) = -1 (not divisible by 11) (c) 315624 (3+5+2)-(1+6+4) = -1 (not divisible by 11) (d) 415624 (4+5+2)-(1+6+4) = 0 (divisible by 11)

Unleash the topper in you

IF a number is divisible by 11, the Difference of Sum of digit of digit at odd blaces & Sum of digits of even blace is either 0 or divisible by 12.

5-which on of the following no. is divisible by 24? (6) 63810 (d) 3125736 (a) 35718 (c) 537804 3 (8) sal. 35718 3+5+7+1+8 718 x = 24 V 63810 6+3+7+8+1+0 810 X = 18 537804 5+3+7+8+0+4 804 x =27 3125736 3+1+2+5+7+3+6 736V = 27 If a no is divisible by another humber, then it must be divisible by its Primi Factors 6-The digit at unit's place of the product $81 \times 82 \times 83... \times 89$ (a) 0 (b)2 (c) 6 (d) 8 81x 82x 83 - - - - × 89 is sol. (ato (C)6 (b)2(q)SWAD 81X 82 X 83 X 84 X 85 X89 1x2x3x20----x6x7x8x9 multiple a number of o, the cresult at unit If we place is always zero.